

Juvenile Prosecution: Trending Topics for the 21st Century

Friday, December 13, 2019
APAAC Training Room
1951 W Camelback Rd., Unit 202,
Phoenix, Arizona



Up in Smoke: Marijuana Vaping

Presented by:

Samin Adib

Deputy Maricopa County Attorney

Nikki Petrin

Forensic Scientist, Arizona Department of Public Safety - Crime Laboratory

&

Giang Pham

Forensic Scientist, Arizona Department of Public Safety - Crime Laboratory

Distributed by:

ARIZONA PROSECUTING ATTORNEYS' ADVISORY COUNCIL

1951 West Camelback Road, Suite 202


Phoenix, Arizona 85015

ELIZABETH BURTON ORTIZ


EXECUTIVE DIRECTOR

APAAC TRAINING DECEMBER 2019

ARIZONA DEPARTMENT OF PUBLIC SAFETY
SCIENTIFIC ANALYSIS BUREAU



Giang Pham
Nikki Petrin



1

AZ DPS CRIME LAB SYSTEM


| Northern Regional Crime Lab, Flagstaff | Central Regional Crime Lab, Phoenix | Southern Regional Crime Lab, Tucson | Western Regional Crime Lab, Lake Havasu City |
|---|--|---|---|
| <ul style="list-style-type: none"> Forensic Alcohol, Drug Toxicology, Latent Prints, Controlled Substances, and DNA. | <ul style="list-style-type: none"> Forensic Alcohol, Full Drug Toxicology, Latent Prints, Controlled Substances, Firearms, Trace Evidence, Questioned Documents, DNA. | <ul style="list-style-type: none"> Forensic Alcohol, Drug Toxicology, Latent Prints, Controlled Substances, Firearms, and DNA. | <ul style="list-style-type: none"> Forensic Alcohol, Latent Prints, Controlled Substances. |

2

DPS Forensic Scientists serve to not **only** to document and analyze evidence, but they also serve to **present and interpret results in court.**

Contact us:

- Central Lab 602-223-2394
- Northern Lab 928-773-3687
- Southern Lab 520-746-4575
- Western Lab 928-680-5490



3

ALCOHOL/DRUG TOXICOLOGY



Forensic toxicology plays a large role within the impaired driving enforcement community.



Toxicology is the science of identifying and understanding foreign substances in a biological system.



Forensic toxicology is the practice of identifying and understanding these foreign substances as they apply to the law.

4

THE CRIME LAB AND YOU



Forensic Scientist can tell you...

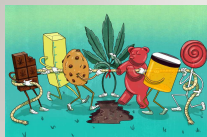
- General effects of that drug
- General effects of drug combinations
- General effects on human performance
- Documented therapeutic levels and estimated half life



Forensic Scientist cannot tell you...

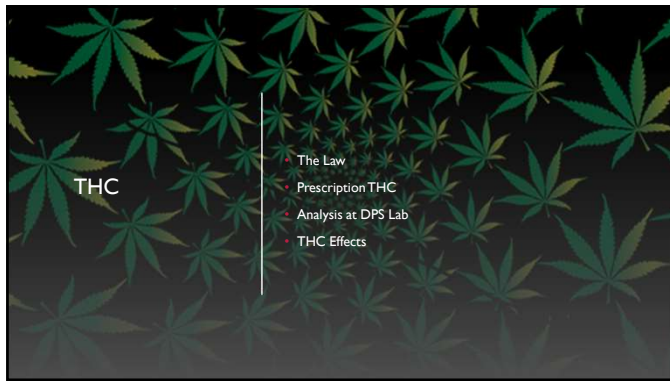
- If the person was impaired
- Exactly when the person used the drug
- How much the person consumed

5

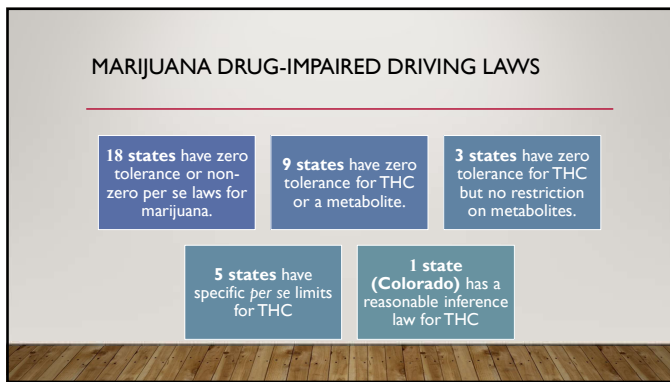


MARIJUANA AND THC

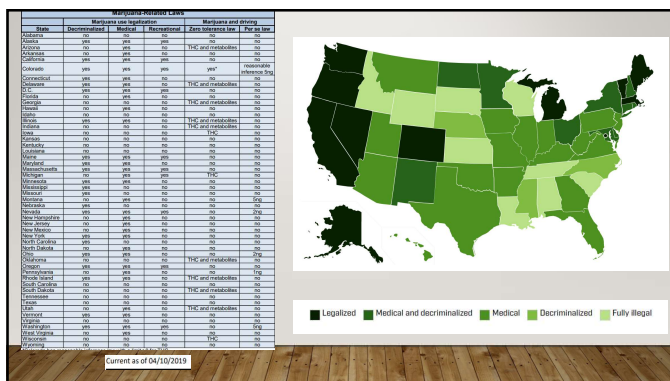
6



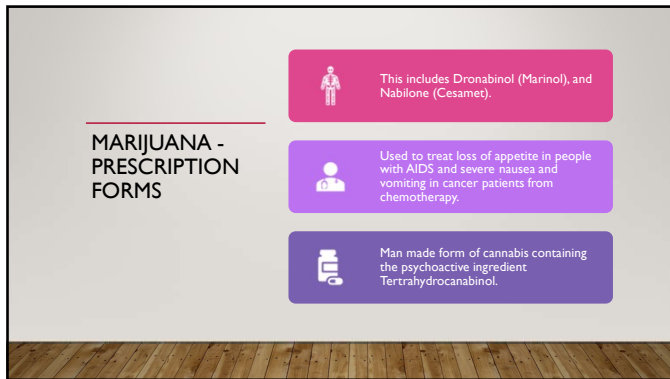
7



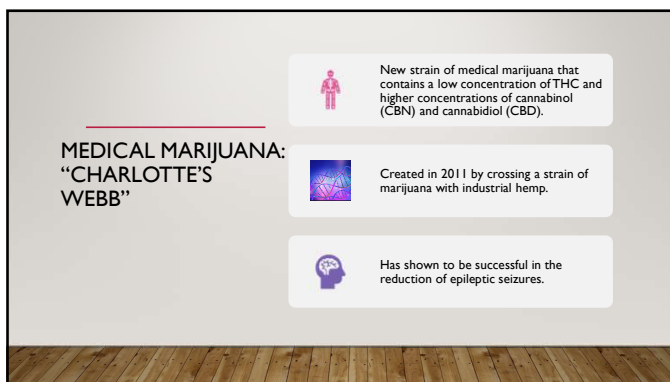
8



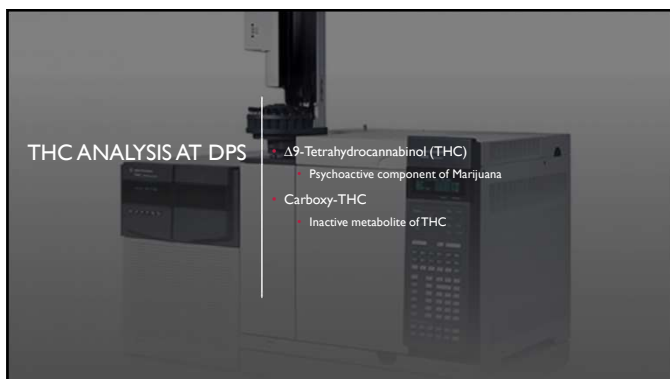
9



10



11



12

OTHER CANNABINOIDS OF NOTE

- **11-Hydroxy-THC**
 - Psychoactive metabolite of THC but typically found at 1/10th concentration of THC
- **Cannabidiol (CBD)**
 - Cannabinoid with no federal regulation
- **Cannabinol (CBN)**
 - Cannabinoid with no federal regulation

**JUST FOUND OUT
I PASSED MY
DRUG TEST**
MY DEALER HAS SOME EXPLAINING TO DO.

13

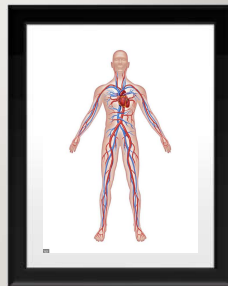
SIGNS AND SYMPTOMS OF THC LABORATORY TESTIMONY

- | | |
|--|--|
| <ul style="list-style-type: none"> • Physical effects: • Conjunctival suffusion (red eyes) • (redness of the eyes w/ no discharge) • Rebound dilation • Dry Mouth/throat • ↑ Appetite • Tachycardia (↑ Heart rate) • Hypo/hypertension • Dizziness • Ability to affect touch, sight, hearing, taste and smell | <ul style="list-style-type: none"> • Driving concerns: • Slower reaction time • Impaired time/distance estimation • Inability to maintain headway/lateral travel • Subjective sleepiness • Lack of motor coordination • Impaired ability to sustain vigilance • Loss of coordination • Poor ability to perform divided attention tasks |
|--|--|

14

PHARMACOLOGY

- **Smoking** - highest/quickest absorption
- **Immediate effects felt. High lasts ~2-3 hrs**
- **Effects** return to baseline w/in **3-5 hours**. Possibly, up to 24 hours for complex divided attention tasks
- Effects peak at **9-23 minutes** after start of smoking. [THC] and [11-OH-THC] decline rapidly and are below detection limit within **2-3 hours**.
- Chronic smokers can have [THC-COOH] of 45ng/mL 12 hours after use w/ [THC] ~1ng/mL
- Studies show levels as low ~1.6 ng/mL in serum have been linked to possible impairment.



15

CANNABIS EFFECTS – DRE MATRIX

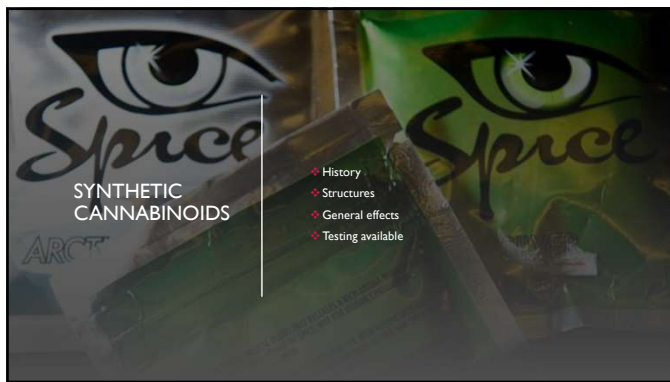
Physiological Indicators:

- HGN: none (not present)
- VGN: none (not present)
- Lack of Convergence: present
- Pupil Size: dilated or possibly normal (within the DRE average ranges)
- Reaction to Light: normal
- Pulse Rate: up
- Blood Pressure: up
- Body Temperature: normal (within the DRE average ranges)

DRE Symptomatology:

- dilated pupils
- marked reddening of conjunctivae
- odor of Marijuana
- debris in mouth
- body tremors
- eyelid tremors
- relaxed inhibitions
- increased appetite
- paranoia
- disorientation
- impaired perception of time and distance

16



17

CANNABINOID HISTORY



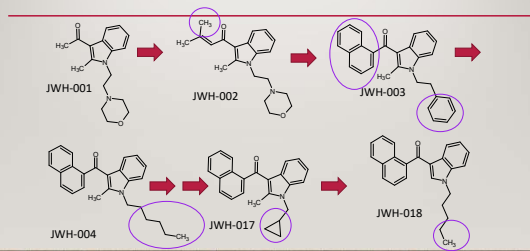
1992: Mechoulam's lab discovered the first endocannabinoid, anandamide.



1990's: J.W. Huffman and el. synthesized numerous synthetic cannabinoids designed to study cannabinoid receptors (JWH-018, JWH-073)

18

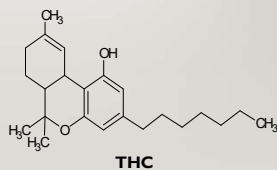
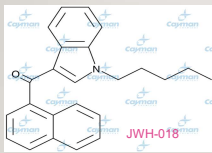
EARLY PROGRESSION OF JWH COMPOUNDS



19

SYNTHETIC CANNABINOIDS BASICS

- What are synthetic cannabinoids?
 - Chemicals that mimic the actions or have a similar structure to THC



20

SYNTHETIC CANNABINOID EXAMPLES



21

SYNTHETIC CANNABINOID TERMINOLOGY

- "Spice" - Brand name for one of the original (if not the original) herbal blend that contained synthetic cannabinoids.
- "Spice" - Generally speaking, it's used to represent all herbal blends that contain synthetic cannabinoids.
- Synthetic cannabinoids refer to a growing number of human-made mind-altering chemicals sprayed on dried, shredded plant material or vaporized to produce a high.
- Synthetic cannabinoids are sometimes misleadingly called "synthetic marijuana" (or "fake weed") because they act on the same brain cell receptors as THC, the mind-altering ingredient in marijuana.
- The only parts of synthetic cannabinoid products that are "natural" are the dried plant materials. Chemical tests show that their active ingredients are human-made cannabinoid compounds.



22

EFFECTS

<https://www.drugabuse.gov/publications/drugfacts/synthetic-cannabinoids-k2spice>

Synthetic cannabinoid users report some effects similar to those produced by marijuana:

- elevated mood
- relaxation
- altered perception—awareness of surrounding objects and conditions
- symptoms of psychosis—delusional or disordered thinking detached from reality

Psychotic effects include:

- extreme anxiety
- confusion
- paranoia—extreme and unreasonable distrust of others
- hallucinations—sensations and images that seem real though they are not
- rapid heart rate
- vomiting
- violent behavior
- suicidal thoughts

23

SYNTHETIC CANNABINOIDS

- DPS does not test at this time
- Contact the Laboratory if analysis is needed

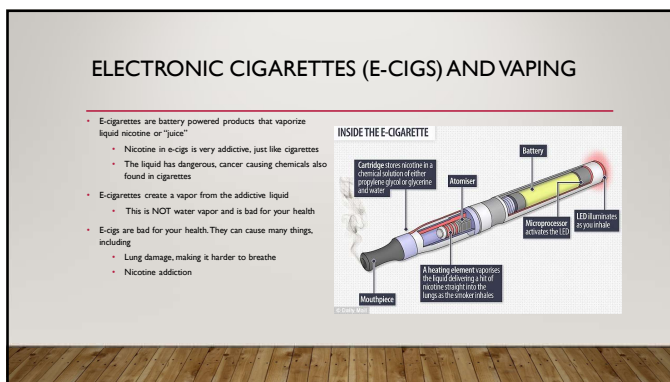
Q. Will the ingestion of Spice result in a positive urinalysis/blood testing?

A. No if screening for Δ^9 -THC metabolites.

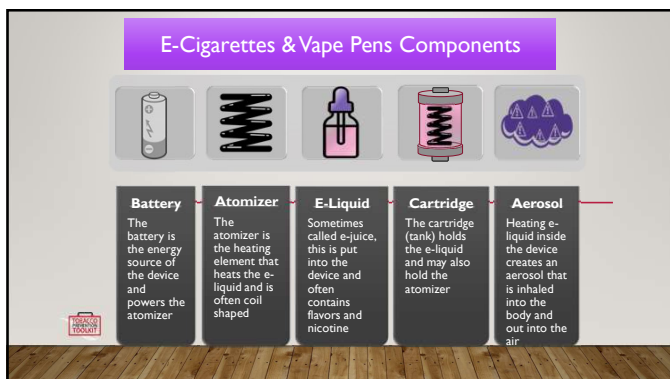
24



25



26



27



28



29

ELECTRONIC CIGARETTES (E-CIGS) AND VAPING

Manufacturers sell their products by:

- Using celebrities to pitch their products
- Sponsoring sports and music festivals
- Showing attractive people using the product
- Using cartoons and flavorings that are sweet and appealing
- Telling their audience to switch to e-cigs, instead of quitting tobacco use

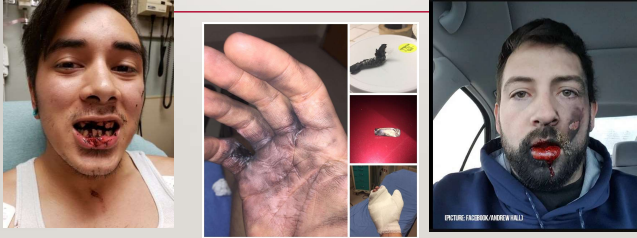
The image shows a row of ten different e-cigarette pens. They are arranged vertically and vary in color (blue, white, green, black, red, silver, etc.) and design. Some have buttons, while others are more sleek and minimalist.

Image courtesy of the American Academy of Pediatrics, Julius B. Richmond Center of Excellence.

E-cigs are not a safe alternative to cigarettes.

30

Electronic Cigarettes (E-Cigs) and Vaping



31

ELECTRONIC CIGARETTES (E-CIGS) AND VAPING

- JUUL® is brand of e-cig or vape
- JUULs® contain nicotine and are just as addictive as cigarettes
 - Nicotine is in the cartridges, which come in flavors to appeal to kids
- Youth who use JUULs® are more likely to use cigarettes later in life
- JUULs® are not safe alternatives – they are still very addictive and bad for your health

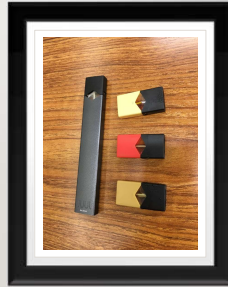


Image courtesy of the
American Academy of Pediatrics
Julius B. Richmond Center of Excellence

32

ELECTRONIC CIGARETTES (E-CIGS) AND VAPING COMPOSITION

Blue – Make at home
Red – Dangerous, part of second hand smoke

*Not a complete list – still more compounds potentially present

| | | |
|-------------------------------|--------------------------|------------------------------------|
| • Propylene glycol | • Anthracene | • Selenium |
| • Glycerin | • Pyrene | • Arsenic |
| • Flavorings (many) | • Acenaphthylene | • Nitroamines |
| • Nicotine + NBN ⁴ | • Acenaphthene | • Polycyclic aromatic hydrocarbons |
| • NAK | • Fluoranthene | • Cadmium |
| • NAB | • Benzo[a]anthracene | • Silicon |
| • NAT | • Chrysene | • Lithium |
| • Ethylbenzene | • Benzo[e]pyrene | • Lead |
| • Benzene | • Indeno[1,2,3-cd]pyrene | • Magnesium |
| • Xylene | • Benzo[ghi]perylene | • Manganese |
| • Toluene | • Acenaphthene | • Potassium |
| • Acetaldehyde | • Acrolein | • Titanium |
| • Formaldehyde | • Silver | • Zinc |
| • Naphthalene | • Nickel | • Zirconium |
| • Styrene | • Tin | • Calcium |
| • Benzo[b]fluoranthene | • Sodium | • Iron |
| • Chlorobenzene | • Strontium | • Sulfur |
| • Crotonaldehyde | • Barium | • Vanadium |
| • Propionaldehyde | • Aluminum | • Cobalt |
| • Benzaldehyde | • Chromium | • Dispersant |
| • Valeric acid | • Boron | • Diethylene Glycol |
| • Hexanal | • Copper | |
| • Fluorine | | |

33

ELECTRONIC CIGARETTES - VAPING

- From 2011 to 2018, high school students who smoked conventional cigarettes declined substantially, from 16 percent to 8 percent, a historic low.
- However, e-cigarette use among high school students tripled from 2013-2014, that brought the percentage of high school students who use e-cigarettes to 13%.
- In 2017 this percentage increased to 27.8%
- It is now 37.3% in 2018
- This increase – driven by the e-cigarette use – has erased the decrease in current use of other tobacco products.

34

ELECTRONIC CIGARETTES (E-CIGS) AND VAPING

- As of September 25, 2019, the CDC reports 530 confirmed and probable cases of lung disease associated with e-cigarette product use, or vaping reported by 38 states, including Connecticut, and the U.S. Virgin Islands.
- Nine total deaths have been confirmed in seven states: California, Illinois, Indiana, Kansas, Minnesota, Missouri and Oregon.
- While this investigation is ongoing, the CDC recommends that people should consider not using e-cigarette products.
- The FDA is planning to ban all flavors including mint and menthol flavored electronic cigarette fluid.
- Nationally in 2019 27.5% of high school students reported using electronic cigarettes.

35

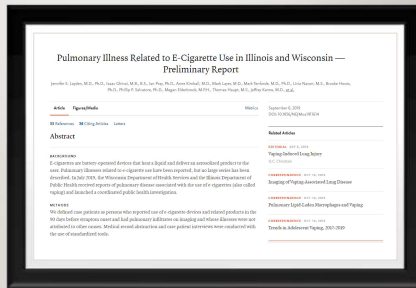
ELECTRONIC CIGARETTES (E-CIGS) AND VAPING



The screenshot shows a webpage from Clinical Chemistry. The title of the article is "Controlled Cannabis Vaporizer Administration: Blood and Plasma Cannabinoids with and without Alcohol". The page includes a search bar, navigation links (Home, About, Journals, News, Research, Archives, Special, Contact), and a sidebar with a "Quick Search" box and a "Related Articles" section. The main content area displays the article title and a brief abstract.

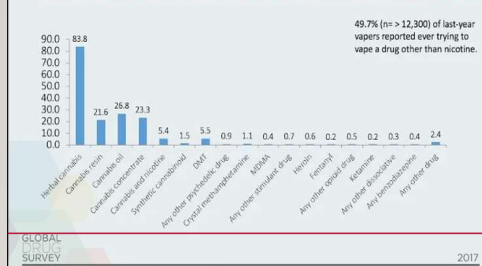
36

ELECTRONIC CIGARETTES (E-CIGS) AND VAPING



37

Results from GDS2017: Which of the following drug have you ever tried to vape? (%)



ELECTRONIC CIGARETTES (E-CIGS) AND VAPING

38

ELECTRONIC CIGARETTES (E-CIGS) AND VAPING



39

LABORATORY CAPABILITIES

Based on the results of the preliminary screen and any information given on the scientific analysis request sheet, a confirmatory test is performed.

The results of these confirmatory tests is what is reported on the laboratory reports.

40

LABORATORY CAPABILITIES – PRELIMINARY TESTING

- Preliminary testing is limited in its capabilities because it only tests for certain categories of drugs.
 - Barbiturates
 - Benzodiazepines
 - Cocaine metabolite
 - Opiates
 - THC
 - Methamphetamines
 - Methadone
 - Carisoprodol
 - Zolpidem

41

LABORATORY CAPABILITIES - PRELIMINARY SCREEN

| Cannabinoids (THC) | Methamphetamine | Cocaine |
|--------------------|--------------------|-------------------|
| Carboxy-THC | Methamphetamine | Benzoyllecgonine |
| THC | MDMA (Amphetamine) | Cocaine |
| | | Cocacetylene |
| Barbiturates | Methadone | Zolpidem (Ambien) |
| Alcohol | Methadone | Zolpidem |
| Barbital | | |
| Pentobarbital | Benzodiazepines | Opiates |
| Phenobarbital | Alprazolam | Morphine |
| Secobarbital | Clozapem | Codine |
| Barbital | Diazepam | Hydrocodone |
| | (Naloxone) | Hydroxycodone |
| | (Etazepam) | (Oxycodone) |
| | Flunitrazepam | (Fentanyl) |
| | Lorazepam | |
| | (Midazolam) | |
| | Temazepam | |
| | Triazolam | |
| | (Flunitrazepam) | |

42

43

[illegible]

44

45
